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ABSTRACT

The discussion of technology in the classroom, particularly for second language instruction, looks at: current practices in technology-enhanced schoolrooms or learning centers; benefits and liabilities of technology-mediated language learning; and the as yet unrealized promise of computer-assisted language learning for the student and the teacher. A brief introductory section chronicles the history of the digital revolution. Current practices in a number of areas are then described, including the teaching of composition as a process, multiple learning styles and individualized learning, the role of authentic language in language learning and in content-based learning, collaborative and task- based learning, and the role of cognition in language learning. Potential future directions for technology-enhanced instruction are examined. Contains a glossary, 8 references, and 10 Internet and World Wide Web site addresses. (MSE)

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Technology in the Classroom

Practice and Promise in the 21st Century

Elizabeth Hanson-Smith

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Technology in the Classroom

Practice and Promise in the 21st Century

Twenty-five years ago, there were no personal computers. Today, almost 30% of U.S. households own a PC, and more than 60% of U.S. students use computers in schools. There seems little doubt that the personal computer will become as prevalent around the world as the TV and VCR, perhaps in some form replacing these appliances by the beginning of the new century. The past 2 years have seen greatly expanded access to the Internet, a global telecommunications network using satellite and ground relays, especially since the advent of easily used graphical software (referred to generically as the World Wide Web) and the entry of commercial service providers. People all over the world, including language learners and teachers, now have the potential to communicate freely and instantaneously with one another. While debate rages hotly over the benefits and liabilities of global exchange and ubiquitous marketing, classroom teachers struggle to catch up and keep up with the dazzling array of new products and uses spawned at a dizzying rate by the digital revolution.

This document examines some of the

- current practices in technology-enhanced schoolrooms or learning centers
- benefits and liabilities of technology-mediated language learning and teaching
- as yet unrealized promise of computer-assisted language learning for the student and the teacher.

The Digital Revolution

The second half of the 20th century has seen the acceleration of a digital revolution that is transforming the way in which the world socializes and does business. It is called a *digital* revolution because information of many kinds—text, sound, graphics, video—is transformed into the digits 1 and 0, or more simply, on and off switches. Already, almost every appliance in households in the developed world is using the silicon-based computer chip: television, radio, audiotape recorder, CD player, microwave and conventional gas and electric ovens, phone, fax, and word processor. It is considered a *revolution* because of the radical changes that seem to be underway.

If we look at the Gutenberg Revolution, that is, the introduction of the printing press, we see gradual changes in many interrelated areas. Gutenberg changed the way people spent their free time—reading books instead of telling stories. Where before only a privileged few could afford to own a book, this revolution opened the way to the education of large numbers of people, and created a new social segment, the middle class. It gave us new forms of literature, such as the newspaper, the magazine, and the novel. It made more local control of information possible, and hastened religious changes in Europe—the Reformation and Counter-Reformation. It also hastened political changes by making possible universal suffrage and the relatively rapid dissemination of such radical ideas as those of the American and French Revolutions. And it brought us a new institution, the postal service.

Likewise, the Digital Revolution is changing how we spend our free time—watching television, playing video and computer games, and chatting on the Internet. Where education has long been controlled by schools and universities, information is now accessible by the individual at his or her own discretion; one may visit a museum in Paris, a library in Washington, and a research institute in Sydney with equal ease. News events may be researched by the individual in far greater depth than a print newspaper might afford the masses, and political opinions (or opinions about anything under the sun) may be disseminated glob-

ally in a matter of seconds. We are already speaking of possible changes in electoral and legislative processes, and of a universal "e-cash," or electronic money. We have a new institution that links individuals and groups around the globe instantly, the Internet. The social changes of the Digital Revolution are barely beginning to be felt, but many cultural observers believe they will be as vast and far-reaching as those generated by the printing press.

At present, the Digital Revolution is still in its infancy. Personal computers are still relatively cumbersome and at times daunting to use: They are too slow; they sometimes "crash"; the heat of their disk drives interferes with their sound reproduction; there are incompatibilities of hardware and software; they are still too expensive for lower income households. All these may be considered surmountable problems that will disappear as PCs become faster and smarter and cheaper. It is estimated that every 18 months there is an improvement in computer chip design, and lower end computers become cheaper as new and improved models are introduced. This document assumes that the present level of technology will be quickly superseded, and that we can safely envision computers in the future that are as easy to use as the telephone is today. Like the cellular phone, the personal computer will eventually become a wireless, go-anywhere appliance, that is small, light, convenient, and capable of putting us in touch with students wherever and whenever they want to learn. Given this premise, this document will ignore the more technological aspects of computers in order to focus on ways in which the Digital Revolution is effecting an educational revolution, that is, the ways in which the PC and related equipment can support and enhance pedagogical practices.

Current Practices

The use of technology often seems to relate fortuitously contemporary pedagogical theory. For instance, the popularity of audiolingual methods and the emphasis on the oral component of language coincided with the development of an affordable technology for audiotaping, and most language teachers at the beginning levels today make exten-

sive use of their personal tape recorders to augment listening activities in the classroom. Likewise, trends in language teaching today, such as process-oriented composition, collaborative learning, and portfolio assessment, seem to dovetail effectively with the current state of technology. Conversely, technology-enhanced learning has the potential to support innovation in instruction. The following sections suggest some of the pedagogical practices that have benefited or will benefit from technological enhancement.

Composition as Process

The theory of teaching writing as a process was around for some time before the advent of word processing, but the word processor has made this pedagogical principle work. With the word processor, students can be asked to perform major revisions on multiple drafts without fear of fatigue or the introduction of new errors because of laborious recopying or retyping. Paragraphs can be reordered with the touch of a few keys. A split screen feature allows teachers to comment "in the margin," or lets students keep an outline on the desktop at all times. Spell checking, a common feature of word processors, not only catches typographical errors but can help students learn to spell. Grammar checkers, although limited in their ability to find typical language learner errors, can allow teachers to customize what is searched and commented on. A bonus for the product-oriented teacher is that students have the satisfaction of a truly finished-looking product, which may easily, with desktop publishing (DTP) software, be turned into attractive school or class newsletters, cookbooks, family or personal histories, and so on. Many of the DTP capabilities, and the grammar and spell checkers, are available as a part of any sophisticated word processor software. And because students can store their work on individual diskettes, word processing or desktop publishing (DTP) can readily be adapted to the one-computer classroom, even if that computer has very little resident memory. Although the word processor is now as common a tool as the typewriter used to be, networking (both local area networks [LANs] and Internet) provides writing teachers with another way to expand the pedagogy of composi-

tion. An important element of writing-as-process is "talk," both before and after the writing itself. Brainstorming, prewriting, outlining, and organizing are important elements in the process of invention: finding a topic, developing its schema, imagining an audience, taking on a voice or point of view. Peer editing of drafts has also become a significant element in the teaching of writing, because becoming a good writer involves becoming an analytical reader as well. Software that allows brainstorming and peer review online has many advantages over the printed copy approach, not the least of which is a great savings in paper. An online group need not be dominated by the fastest, hardest talker because each student has time to formulate and type at his or her own pace. (This is an especially important element for mixed-culture groups.) Every member of the group (and the teacher) has a chance to review all of the comments, as the text file remains a permanent record, a feature that is also useful for portfolio assessment. The teacher, who can quickly review electronically the entire conversation proceeding in each of several groups, rather than just "eavesdropping" for only a moment as she hops from group to group in a realtime classroom, may influence the discussion at any time. And class members who are absent may also review drafts and class discussions, whether from a sickbed across town or a distance learning site halfway around the world. Small wonder, then, that among the many courses now offered online for distance degrees, composition figures prominently. Thus, word processing, although only a modest technological advance, enhances and supports a significant educational approach in the field of composition, particularly when it is combined with such powerful tools as DTP and networking.

Multiple Learning Styles/Individualized Learning

It is a commonly held belief among language teachers that students have a variety of learning preferences or styles. Researchers also note that the more different neuro-systems are deployed in learning, the better something is learned and the more easily it is accessed again later. Computer technology is superbly adapted to this concept in that it can provide sound, color, graphics, animation, video—in addition to or lay-

ered onto text. Most schools today are seeking the ultimate in multimedia software: programs with all the bells and whistles, where students can receive comprehensive, individualized instruction in all the skills simultaneously—listening, speaking, reading, and writing—with record-keeping and adaptive testing to boot.

Certain new technologies are making multimedia software come closer to these desiderata. The talking word processor will "speak" text written by the student, in a variety of languages and voices. Speech recognition technology allows the student to record answers to questions, and the computer judges the accuracy of the reply against its internal model (which may be recorded by the teacher). Software allowing answer-judging over the Internet with the click of a button and software to provide two-way video exchanges over the Internet are already being used for interactive distance learning.

Because sound, video, and graphics data gobble up enormous amounts of digital space, the CD-ROM (compact disc-read-only memory) has become a standard storage device for multimedia. Industry-wide protocols have allowed the CD rapid and universal acceptance, making *CD-ROM* and *multimedia* almost synonymous in most people's minds, but larger and more powerful storage devices are appearing already, as are affordable personal CD burners and recordable CDs. There is also speculation that exercises, tests, and student records, for example, may be stored and used directly on the Internet, thus eliminating the need for anything but a network computer (NC) with very limited storage memory of its own.

Although there is much excitement generated by the use of color, sound, and video in software and over the Internet, the chief failing of multimedia thus far has been the lack of appropriate pedagogy. In the present state of the art, the media aspects often drive the content, rather than the other way around. Thus, media are used to get the students' attention or keep them interested—to entertain—rather than to support cognition and memory. Also, the question-answer, multiple choice, push-the-right-button-to-answer format prevalent in most multimedia

instructional software is really no more pedagogically sound than its plain vanilla paper text counterpart. Its chief advantage is the possibility for instant error checking and scoring. Until there is some pedagogical research grounding the use of multisensory learning, multimedia seems to be an expensive bore once the student gets used to the sound and light show.

Computers are patient, they speak clearly, and they don't (in their best incarnations) give off subtexts implying that the user is dumb; however, the current success of multimedia software may be that the student is kept busy and feels safe: He or she doesn't have to perform real communicative acts with other people. Students may do well on the drill software, but not show marked improvement in real life written and oral communication. The initial hope for multimedia technology, perhaps not clearly articulated, was that computers could replace teachers; the student, alone with the private computer tutor, would make immense progress. This, very clearly, is not going to happen, no matter how attractive the multimedia packaging. However, technology lends itself to other, perhaps more appropriate pedagogical models that use multimedia in highly effective ways.

Most classrooms around the world are still four walls, desks and chairs, and a chalkboard. The teacher and the textbook are relied upon as the primary inputs, models, and sources of interaction. The injection of even a modest level of technology in the form of an Internet link (though still beyond the means of many developing nations) can mean an enormous expansion of this impoverished physical space. Visual aids, such as photographs, drawings, and even video; sound to provide more linguistic diversity and extended listening practice; e-mail to chat with neighbors across the ocean—the whole world can be brought into the classroom and students can interact over the Internet with other learners and native speakers. The computer has the potential to allow individuals to use the learning styles they prefer, and to proceed through programmed learning at their own pace, with instant correction, explanation, and reinforcement. These advantages to technology are not suf-

ficient to learn a language, however, and they are certainly not all the computer has to offer.

Authentic Language/Content-Based Learning

Because oral and written language are primarily a means of communication—between people, among groups, and internally in self-definition—it is generally thought that authentic language—language used by real people in real contexts for real purposes—makes the best model for learning. In school settings at the beginner level, such interactions may be between learners negotiating tasks in some form of interlanguage; for advanced learners, authentic language may imply the academic discourse necessary to write papers and give oral reports in the student's major concentration. One difficulty with computers is that despite their amazing memory capacity and speed of processing, they are still no match for the intricacies of natural language. Thus, some of the most useful applications of technology have been as tools to make authentic communication happen, rather than as conversation partners or task masters. Two areas of computer-enhanced instruction in particular seem fruitful: Internet exchanges and simulations.

The Internet and its multimedia version, the World Wide Web, allow the instantaneous exchange of information both to and from archive sites and between and among individuals. Language learners may post messages to a bulletin board, which users may "drop by" to look at, or they may join a list and have messages sent directly to their own "mail box," or they may enter "live" chat areas where communication is simultaneous, as if one were "talking" by typing. A number of sites now exist specifically created for ESL learners (and for learners of other languages as well) to exchange ideas on topics of real interest to them. Real-time chat rooms, MOOs (Multi-User Object-Oriented sites) or Telnet sites also usually have access to an online dictionary for quick, real-time searches. Thousands of English learners all over the world are currently participating in such activities as part of their regular classroom assignments.

Although more difficult to arrange, simulations, available in software packages and online, are gaining increasing popularity both in content area courses and in language classes. Computers as storage and memory-processing devices are especially apt at handling simulations data. The creation and maintenance of a city or an ecological system, the building of a business enterprise or a new DNA structure, the undertaking of an elaborate adventure game or a nuclear reaction—these are possible because the computer can store millions of bits of information, organize them, and sort them quickly in hundreds of different ways. Students learn the typical vocabulary and structures of the content being manipulated; they can play with or against other individuals or teams, comparing notes on successes or failures; and they can write up their experiences as guides for others to follow. As more and more schools come online, simulations are being played by e-mail or over the Web.

In all these instances, students themselves generate authentic language to accomplish real purposes while the technology—computer and/or satellite linkage—is the facilitator and stimulator of communication. We are only just beginning to see software that is deliberately designed to provide simulated experiences as a means to teaching and learning language.

Collaborative Learning/Task-Based Learning

Another pedagogical thread, clearly related to authentic language, is collaborative learning. The early model of language learning places the student alone at a desk, with grammar book, dictionary, and text arranged symmetrically in front of him or her. Collaboration, however, implies that learners take an active role in helping each other to accomplish a task that is a vehicle for using authentic communication. Some examples of collaboration in a traditional or non-technology-enhanced classroom might include peer editing in composition workshops, jigsaw listening or reading problems solved by teams, and dramatic role playing—in short, any activity whose success requires group cooperation and the use of the target language.

Technology-enhanced collaboration can make task-based learning an exciting event. Presentation or authoring software allows students to learn quickly how to create a professional-looking presentation on any subject, and is especially appropriate to an "I-Search" type of project for beginners, where the topics are developed as a group, with teacher guidance, and so entail high personal commitment to their completion. CD-ROM encyclopedias, Internet searches, and materials brought from home provide sounds, photos, video clips, and text-based information that students can incorporate into their multimedia show. Publication of the project on the World Wide Web or an oral presentation with a projection device to the class or school makes sharing the project far easier than with a paper product, and gives students great personal satisfaction in their achievement. Schools oriented to technology are already using multimedia collaborative and individual projects as part of their student assessment portfolios, which give a very complete picture of many facets of achievement and which may easily follow the student electronically when he or she transfers to another school.

The Internet allows for collaborative tasks on a global scale. Classroom curricular exchanges around the world now take place with increasing frequency. In such collaborations, two or more classes and their teachers decide on a joint curriculum project and then exchange materials (physical or electronic), research information, and final reports. Often such exchanges involve considerable cultural exploration and result in a collaborative newsletter or web site or the production of a multimedia version on CD-ROM. The development of interactive software for the World Wide Web makes this kind of collaborative project increasingly easy and of particular interest to students because of its multimedia capability and its intercultural nature. We are only just beginning to see research on learner language use on the Internet, but there is no doubt that this electronic medium is a potent force for global communication, that language students can reap many benefits from the exchanges already possible, and that sites for exchange are growing weekly. (See Useful References for links to exchange sites on the Web.)

The Role of Cognition

Current practices in language teaching increasingly reflect a movement away from envisioning language learning as a subconscious and largely passive acquisition of language, primarily through exposure to the spoken word, and toward a more proactive, conscious, cognitive endeavor in which the learner is encouraged to access, evaluate, and deploy strategically his or her own learning methods in a deliberate manner. Anna Uhl Chamot and J. M. O'Malley (see Useful References) have written extensively on the value of a cognitivist approach to learning language for academic purposes, claiming that the student can be taught to monitor, train, and enhance his or her own cognitive strategies at a variety of levels, such as memorization, planning, and self-evaluation. More generally, in the field of technology, enthusiasts have used the term *constructivism* to describe an educational approach in which the student, in any subject area, actively constructs meaning while drawing upon a variety of learning styles and input from a variety of sensory systems.

As mentioned above, the typical problem is the sterility of input possible in the average classroom environment, and the paucity of possible communicative interactions. Computer technology, however, can provide the student with the means to control his or her own learning, to construct meaning, and to evaluate and monitor his or her own performance. For example, at the most modest level, software for language learning can provide passive listening input accompanied by a search apparatus so that students may click on a word or sentence to hear it repeatedly, look up a meaning in a bi- or monolingual dictionary, analyze the grammar, query the cultural customs related to the speech, see a related picture or video clip, and read a related text. In this case, the four walls of the classroom not only are enlarged but are put into the student's conscious control.

At a somewhat higher level of technology, the student may hear the computer read a typed sentence, compare his or her voice to an aural or visual computer model of a correct response, or have the computer itself

judge the accuracy of the spoken response recorded by the student. Such software is not totally self-instructional. Teachers have found it necessary to guide students on a path through the material, suggesting strategies for using supplemental references, having students report weekly progress to a human tutor or aide, and scheduling regular human interpretation of computer scores and time-on-task reports in order to advise students about their work habits. If students are to use the rich resources of CDs that were not made specifically for language learners, such as the excellent discs on the natural and social sciences, medicine, and the arts, they will need even further guidance and supplementary language practice.

At a still higher level of technology use, with modem and Internet connections, the four classroom walls may be expanded globally. Students may research current events as they are happening, through news services that include video clips, photos, and sound bites—all downloadable for limited educational use in school. Web sites are also being created where learners may read Special English versions of the news, accompanied by simple language exercises, such as true/false or multiple choice questions and cloze passages. Students may research historical and cultural topics, business matters, art or literature, weather or geography, law or medicine—any of hundreds of topics in thousands of online archives. Students may also query native speakers about their language and customs through e-mail and Telnet sites in a variety of languages, look up words online as they seek to express themselves, and collaborate with learning teams, both native and nonnative speakers of the target language, on the other side of the world—all in a matter of seconds.

As mentioned earlier, such discussion may occur through electronic mail, in which case students may compose queries and replies offline, or at "live" sites where typing is read almost instantaneously. In both cases, communication via the Internet requires student engagement in authentic language encounters that would hardly be possible face-to-face. Although typed communications with online grammar assistance provide a kind of "buffered" authenticity, two-way video and voice links

are already possible and will no doubt eventually become accessible to even the most remote schoolrooms. We may imagine in the future that student classrooms will prepare themselves for video conferencing in the same way they now prepare written materials for e-mail keypals. Again, practitioners already experienced in using the Internet for language learning caution that the teacher must help students carefully plan and organize such learning experiences, rehearse useful language, and understand not only some of the physical operation of the Internet and Web, but the conventions and codes that have become "netiquette" for such communications.

What Lies Ahead?

The enormous potential of technology implies considerable financial investment in computers and peripheral equipment, such as CD players and video cameras, and in phone or cable lines and other Internet provider services. However, even one computer in a classroom may be used effectively for software programs and Internet exploration. And although the prices of personal computers have been dropping dramatically almost every 6 months, the memory and processing power demanded by software has increased geometrically so that newer, faster, better models are always appearing. IBM has already announced a super computer with speeds that will make present personal computers, which are only one generation away from the first Apple II, totally obsolete. Phone and cable companies are battling for supremacy in bringing the Internet into the home, even as satellite and cellular technologies make it apparent that we will all soon be wireless. The best advice in this turmoil seems to be to go with the best technology you can afford at present and upgrade in stages. You don't have to have every machine in the learning center look exactly alike or do exactly the same things.

I have been careful throughout this document to use the term *learning center* rather than *computer lab*. A learning center may have many kinds of machines and activities, and it may be organized into many shapes: one or more computer stations in corners of a classroom, clusters of four at round tables, or rows around the periphery of a room with a

central meeting space. The term implies a place where technology becomes simply a means to the ultimate end: to learn.

On the human side, the uses of technology described in this document imply a heavy investment in teacher training. All too often, a new learning center is severely underused because teachers have not been consulted in its construction, time has not been allocated for them to explore software and applications, and resources have not been committed to training them in appropriate ways of using such a center. Until a whole new generation of technology-literate students graduate and become teachers, we will find many instructors who fear machines and believe they cannot enhance learning, even as it seems inevitable that technology will be increasingly deployed in teaching and learning, just as it is in every other area of our lives. As Claire Bradin (personal communication) has stated, computers will not replace teachers, but teachers who use computers will—inevitably—replace teachers who do not.

Computers will not replace teachers because they cannot do most of the significant things teachers can: lesson planning, individual counseling, preparation and selection of materials, evaluation of process and product, and so on. Teachers of the future will perform the very same functions they do now, but will make use of technology to give students a richer, more stimulating learning environment. But as computers become our new tools, or slaves, we will find that the technology demands new kinds of student-teacher relations: Students must become more autonomous, active learners, and teachers must relinquish some of their power and authority—not to the computer, but to the students themselves. The effect of the digital revolution on teaching and learning will be enormous, and the teaching profession must prepare now for the changes ahead of it.

Glossary of Terms Related to Technology

Adaptive testing: Computer-generated tests that change (adapt) to the user's abilities: When the student answers questions correctly, the next set of questions becomes more difficult and vice versa.

Bulletin board (BB): A place on the Internet where messages may be posted and read by all visitors. Usually anywhere from a few seconds to a full 24-hour delay may intervene before a message is posted.

CALLA: The Cognitive Academic Language Learning Approach, propounded in the work of Chamot and O'Malley, emphasizes conscious learning strategies, such as preplanning and self-evaluation, as an important part of language learning. (See cognitivist approach and Useful References.)

CD-ROM: A compact disc with read-only memory. Data is "burned" onto the disc, which requires a special drive to access it.

CD-R: A recordable compact disc that allows the user to change data and reuse the disc.

Chat room: A place on the Internet where messages may be read by subscribers in real time. (See bulletin board and list.)

Cognitivist approach: An approach to language learning and teaching that emphasizes the learner's use of conscious strategies, such as

preplanning, rehearsing, memorizing, and self-evaluation. (See CALLA.)

Constructivism: An approach to teaching that emphasizes the value of multiple sensory inputs and individualized learning strategies. It is expressed in the work of Semirau and Boyer. (See Useful References.)

DTP: Desktop publishing software allows the user to easily format text in columns, insert headlines, and enhance documents with media such as video or audio clips, photos and graphics.

Digital revolution: Changes at the end of the 20th century owing to the ability of computers to process information as digits.

E-mail: Electronic mail; messages sent person-to-person via the Internet or a local area network (LAN).

Grammar checkers: Computer software (often packaged with a word processor) that analyzes certain limited features of natural language, such as punctuation conventions, passive constructions, and overly frequent use of forms of the verb *to be*.

Gutenberg Revolution: Significant cultural changes that took place owing to the introduction of the printing press.

html: Hypertext markup language, that is, the software commands used to create instructions read by Web navigation software. Html is easily learned by viewing and copying the source codes of pages on the Web. Online lessons to learn html are also available.

http: Hypertext transmission protocol, which allows the Internet to read and transmit media and text in an orderly fashion. (See html.)

Internet: A global telecommunications network based on satellite and ground relays. Originally conceived of as a research tool and means to connect academics in universities, institutes, and government, the Net is now accessible by any individual through commercial service providers.

LAN: a local area network, usually within one building, classroom, or campus, that allows e-mail and transfer of other data within a confined area; often used in writing programs as a means for students to brainstorm and peer edit materials.

List: Electronic messages are received and distributed automatically to a list of subscribers by listserver software. Lists usually are created around a particular interest, such as gardening or ESL teaching. (See chat room and bulletin board.)

MOO: Multi-user, object-oriented site, similar to a conference call, where users may interact with each other synchronously, that is, in "real" time, and select various "places" to visit by typing commands or clicking on choices or objects on the screen. (See Telnet.)

Multimedia software: Programs using sound, color, graphics, animation, video, hypertext links, etc.

NC: A network computer with very little hard drive storage capability used only to access the Internet or a local area network (LAN).

PC: A personal computer, a desktop-sized computer designed for use by one individual. The modern PC is as powerful as first generation mainframe computers of yesteryear.

Telnet: A means of accessing the Internet in which multiple users may "talk" simultaneously. (See MOO.) A Telnet connection emulates entry to the computer from its home site.

Simulation: A type of software in which the computer uses stored data to simulate a real-life experience—such as starting a business enterprise, building a town, or traveling the Oregon Trail—by reacting to decisions of the users.

Speech recognition technology: Software that allows the computer limited recognition of and response to the human voice. Some PCs are already able to turn on and access applications with a verbal

command. Language software may be adjusted as to the preciseness of recognition ability.

Web site: An address on the World Wide Web, often referred to as a *page* or *homepage*, written in http so that users may link to media and to other sites.

World Wide Web: A graphical software interface to the Internet which allows the transmission of sound, pictures, and video, as well as text, and the linking of media and text with the click of a button. Often seen in Web addresses as "www." (See http and html.)

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Warschauer, M. (1995). *E-mail for English teaching: Bringing the Internet and computer learning networks into the language classroom*. Alexandria, VA: TESOL. Uses of the Internet and World-Wide Web in teaching language.

Note: Regular reading of a trade publication, such as PCWorld *or* MacUser *is a must in order to become familiar with innovations and applications.*

Useful Internet and World Wide Web Sites for ESL Learners and Teachers

AskERIC: **http://ericir.syr.edu/** provides access to ERIC-CAL statistics and archives of periodicals and unpublished papers on all aspects of education. Assistance is available for researching specific topics.

CELIA: **ftp://ftp.latrobe.edu.au/pub/CELIA** is an archive of language teaching freeware, shareware, and publishers' demos that may be downloaded for free. The archive at La Trobe University in Australia is organized by human language and hardware type. The English language contents are available on a CD-ROM, *TESOL/CELIA '96*, from TESOL, Alexandria, VA.

Dave's ESL Café: **http://www.pacificnet.net/~sperling/eslcafe.html** created by Dave Sperling as a site specifically for ESL students to use in interactions; also has links to other good sites for teachers and students.

Linguistic Funland TESL: **http://math.unr.edu/linguistics/linguistic.funland.html** created by Kristina Pfaff to provide interesting links to resources in English learning and teaching.

ESL Chat Lists: send a blank e-mail to **announce-sl@latrobe.edu.au** to obtain information automatically on bulletin boards for students set up by Lloyd Holliday; or find out about class-to-class exchanges by e-mailing to Tom Robb at **trobb@cc.kyoto-**

su.ac.jp, giving the number of your students, the duration of the term, and your e-mail address.

ESLoop: **http://www.webring.org/cgi-bin/webring?index&ring=esloop** created by Susan Gaer, presents an index to sites for language learners, especially student-produced Web pages and projects, and exchange opportunities.

html lessons online: **http://cleo.murdoch.edu.au/asu/edtech/asdf95/lessons** is supported by Murdoch University, Perth, Western Australia.

OTAN: **http://www.scoe.otan.dni.us/**, the Outreach and Technical Assistance Network for literacy has a national grant to provide technology services to teachers. Their site includes links to student projects, to a CNN education site with interactive lessons for English learners based on the news in special English, and to thousands of lessons plans for adult literacy and vocational education.

schMOOze U: **http://schmooze.hunter.cuny.edu:8888/** has directions for accessing the Telnet site of this virtual university for English learners designed by Julie Falsetti. Teachers may reserve classrooms, and students may claim their own dormitory rooms. Has access to an online grammar checker and dictionary.

TESL-L: e-mail to **listserv@cunyvm.cuny.edu** with the message SUB TESL-L YRFIRSTNAME YRLASTNAME to receive information automatically about subscribing to this list for teachers. Sublists are organized by teaching interests and levels.

Note: Teachers should spend some time at regular intervals using Net search engines, such as Yahoo, Alta Vista, and Infoseek, to explore the wealth of information available to their students. Be advised that Net addresses and sites change frequently.

The TESOL Task Force on Technology in the Classroom

The Task Force on Technology in the Classroom, chaired by Dr. Elizabeth Hanson-Smith, was created in the Fall of 1993 at the behest of then TESOL president Fred Genesee and the TESOL Executive Board. This document is based in part on the work of that Task Force.

Members of the Task Force included the following experts, who participated in an e-mail discussion list, reading and commenting on each others' area reports. Although a number of participants have not met each other face to face, most are members of TESOL's Computer-Assisted Lan guage Learning Interest Section. They form a community of teachers dedicated to using appropriate technologies in the classroom and to supporting others who are exploring exciting new media for pedagogy.

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The full text of the original Task Force Report (some 75 pages) is available from the CELIA archive at La Trobe University, Melbourne, Australia.

Set your web browser to ftp://ftp.latrobe.edu.au/pub/celia to access the archive index. The full text of the Report will also be placed on the next edition of the CALL Interest Section's CD-ROM.

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